

PATENT APPLICATION

**RESPONSE UNDER 37 CFR §1.116
EXPEDITED PROCEDURE
TECHNOLOGY CENTER ART UNIT 1731**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Yasunao MIURA et al.

Group Art Unit: 1731

Application No.: 10/045,083

Examiner: J. HOFFMANN

Filed: January 15, 2002

Docket No.: 111674

For: METHOD OF FABRICATING HONEYCOMB BODY AND DRYING SYSTEM

**REQUEST FOR RECONSIDERATION AFTER
FINAL REJECTION UNDER 37 CFR §1.116**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In reply to the June 21, 2006, Office Action, the shortened statutory period for reply being extended by the attached Petition for Extension of Time, please consider the following remarks.

The Examiner rejects claims 2-4 and 16 under 35 U.S.C. §103(a) over U.S. Patent No. 5,952,079 to Andou et al. in view of U.S. Patent No. 4,776,998 to Davidson et al., U.S. Patent No. 4,622,057 to Chyung et al., U.S. Patent No. 4,569,661 to Kramer, and U.S. Patent No. 4,439,929 to Kitagawa et al., and optionally in view of U.S. Patent No. 3,731,036 to Hallier et al. and U.S. Patent No. 5,189,273 to Inukai et al. The Examiner also rejects claim 5 under 35 U.S.C. §103(a) over Andou in view of Davidson, Chyung, Kramer and Kitagawa, optionally in view of Hallier and Inukai, and further in view of U.S. Patent No. 3,187,574 to

Mason et al. or U.S. Patent No. 4,315,150 to Darringer et al. Applicants respectfully traverse the rejections.

Independent claim 4 sets forth, in pertinent part, a “method of fabricating at least a ceramic honeycomb body including a multiplicity of cells, ... comprising drying at least an extrusion-molded argillaceous honeycomb body by exposing ... to a high-humidity ambience of not less than 70 % in humidity; and irradiating ... with microwaves having a frequency of 1,000 to 10,000 MHz; wherein ... during drying, the honeycomb body is placed on a ceramic conveyance tray having a porosity of not less than 10%.” Claims 2, 3, 5 and 16 depend from and incorporate all of the limitations of independent claim 4.

The method of claim 4 requires that, during drying by microwave irradiation, the ceramic honeycomb body is placed on a ceramic conveyance tray that has a porosity of not less than 10%. This allows a high-humidity environment to be maintained during microwave drying, by providing humidity in the form of steam to the ceramic honeycomb body and simultaneously preventing water stagnation and elution. *See Specification, page 4, lines 1-16; page 10, line 36 - page 11, line 13; page 13, lines 28-30; page 15, lines 1-5.* By maintaining a high-humidity environment during microwave irradiation heating, similar conditions in the cells and on the outer skin portion of the ceramic honeycomb body are maintained, and similar drying speeds may be obtained. Thus, the claimed method prevents defects in the thinner skin portions of the ceramic honeycomb body and avoids problems, such as dielectric breakdown and undesirable discharge.

The Examiner takes the position that claim 4, and dependent claims 2, 3 and 16 would have been obvious over Andou, in view of Davidson, Chyung, Kramer, Kitagawa and, optionally, Hallier and Inkai. The Examiner further takes the position that dependent claim 5 would have been obvious in view of the references applied to claim 4 and further in view of Mason and Darringer. Applicants respectfully disagree, at least because none of the cited

references provides any teachings or suggestions regarding the use of ceramic conveyance trays having a porosity of not less than 10% during microwave drying. *See generally* Andou; Davidson; Chyung; Kramer; Kitagawa; Hallier; Inukai; Mason; Darringer.

Andou teaches ceramic honeycomb bodies, having partition walls with thicknesses of from 0.05 to 0.13 mm, produced by extrusion molding and drying. *See* Andou, Abstract, col. 6, lines 35-44. The Andou honeycomb bodies are "uniformly heated to evaporate moisture" and fired. *See* Andou, col. 6, lines 40-44. The Andou ceramic honeycomb bodies may have a cordierite chemical structure, and the partition walls of the structure may have a porosity of 35%. *See* Andou, col. 6, lines 11-46. However, the cordierite material is used as the Andou honeycomb structure, not as a ceramic conveyance tray, and the porosity of 35% inhibits chipping while maintaining catalytic properties, but does not provide humidity and prevent water stagnation. *Id.* Further, Andou does not teach or suggest microwave drying, as admitted in the Office Action. Thus, Andou does not teach or suggest a method including the use of ceramic conveyance trays having a porosity of not less than 10% during microwave drying as set forth in independent claim 4. *See generally* Andou.

Davidson teaches drying extrudable compositions under high-humidity conditions to avoid over-drying. *See* Davidson, col. 3, lines 55-58. However, Davidson does not teach or suggest a method including the use of ceramic conveyance trays having a porosity of not less than 10% during microwave drying as set forth in independent claim 4. *See generally* Davidson.

Chyung teaches drying thick walled shapes, such as boards, and extruded honeycomb structures by applying microwave radiation. *See* Chyung, Abstract; col. 9, line 67 - col. 10, line 4. However, Chyung does not teach or suggest a method including the use of ceramic conveyance trays having a porosity of not less than 10% during microwave drying as set forth in independent claim 4. *See generally* Chyung.

Kramer teaches ceramic processing furnaces that operate at high temperatures, such as 1000°C and higher. *See* Kramer, Abstract; col. 4, lines 3-7. The Kramer furnaces may include ceramic conveyance trays, such as cordierite ceramic trays, and sinter ceramic materials at elevated temperatures. *See* Kramer, col. 3, line 10 - col. 4, line 7. Kramer teaches that such processing provides increased abrasion resistance at the processing temperatures. *Id.* However, Kramer does not teach or suggest a method including the use of ceramic conveyance trays having a porosity of not less than 10% during microwave drying as set forth in independent claim 4.

Kitagawa discloses an apparatus for drying a ceramic green honeycomb body by dielectric heating, which Inukai is cited as teaching includes microwave heating. *See* Kitagawa, Abstract, col. 1, line 64 - col. 2, line 14; Inukai, col. 1, lines 14-25. However, neither Kitagawa nor Inukai teaches or suggests a method including the use of ceramic conveyance trays having a porosity of not less than 10% during microwave drying as set forth in independent claim 4. *See generally* Kitagawa; Inukai.

Hallier discloses pre-drying ceramic pieces, such as porcelain plates, by microwave heating in an atmosphere including humidity from water removed from the ceramic pieces, but does not disclose or suggest drying honeycomb bodies or other thin-walled structures under high-humidity conditions. *See generally* Hallier, Abstract; col. 2, lines 55-58. In addition, Hallier does not teach or suggest a method including the use of ceramic conveyance trays having a porosity of not less than 10% during microwave drying as set forth in independent claim 4. *See generally* Hallier.

Mason and Darringer teach infrared optical pyrometers and thermometers, respectively. However, neither Mason nor Darringer teaches or suggests a method including the use of ceramic conveyance trays having a porosity of not less than 10% during microwave drying as set forth in independent claim 4. *See generally* Mason; Darringer.

Because none of the cited references teaches or suggests a method including the use of ceramic conveyance trays having a porosity of not less than 10% during microwave drying as set forth in independent claim 4, Andou, Davidson, Chyung, Kramer; Kitagawa, Hallier, Inukai, Mason and Darringer, individually and in combination, cannot support a rejection of claim 4, or its dependent claim 5.

For at least the above reasons, independent claim 4 and dependent claims 2, 3 and 5 are patentable over the Andou, Davidson, Chyung, Kramer, Kitagawa, Hallier, Inukai, Mason and Darringer references, individually and in combination. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 2-5 and 16 are earnestly solicited.